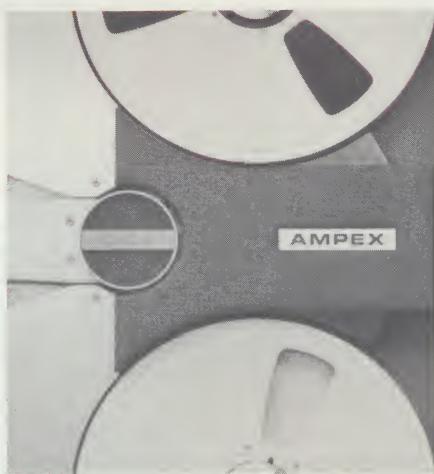


# FIRST OF A NEW GENERATION

## OF LABORATORY RECORDERS FROM AMPEX

### FR-1800

1.5-Mc  
INSTRUMENTATION  
RECORDER



**AMPEX**

# FR-1800

## 1.5-Mc INSTRUMENTATION RECORDER

*A new instrumentation recorder  
from Ampex featuring a  
completely new transport with  
field-proven electronics.*

- Reliability through simplicity of design which eliminates 60% of parts used in comparable recorders.
- Fast response servo provides excellent time base accuracy.
- Chute guides with pneumatic cushioning minimize Interchannel Time Displacement Error.
- Zero-loop capstan lowers flutter.  
No pinch rollers.
- Bidirectional, seven-speed operation for flexibility.
- Requires no mechanical adjustments, minimum electrical adjustments.
- Versatile electronics provide flexibility and compatibility.

### Completely new transport design for high performance

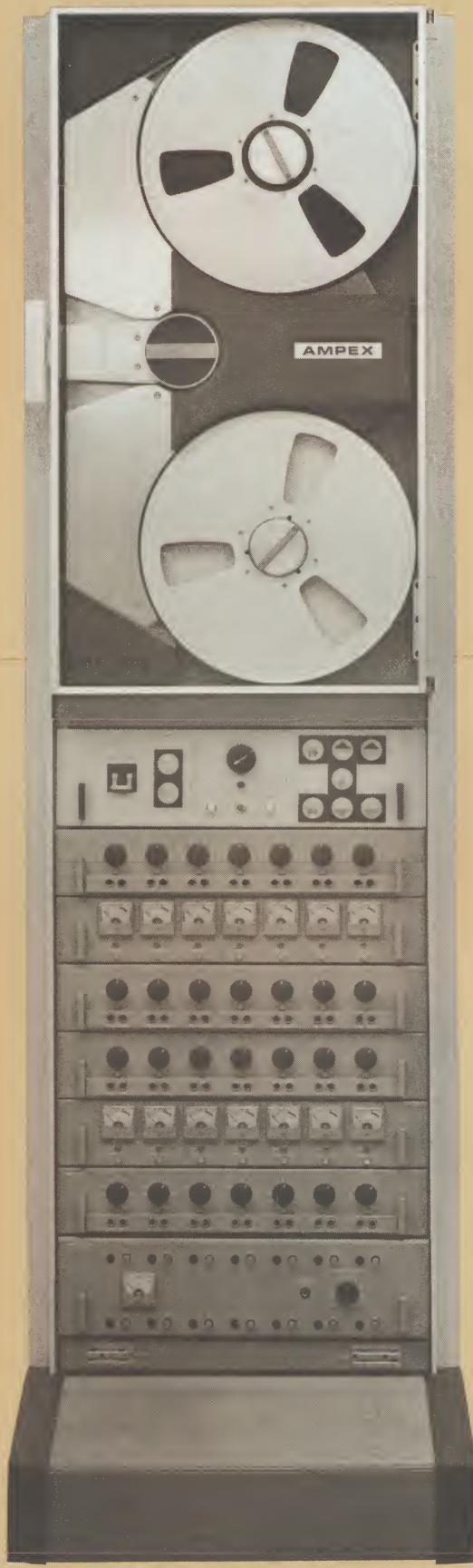
With the FR-1800, Ampex introduces to the instrumentation field a new transport featuring a fast response servo, zero loop capstan and pneumatic chute guides.

This unique new combination of tape control elements offers a new standard in low time base error, flutter, and interchannel time displacement error. Coupled with field proven electronics, the FR-1800 represents an outstanding magnetic tape recorder, destined to become the workhorse of the industry, because of its performance and reliability.

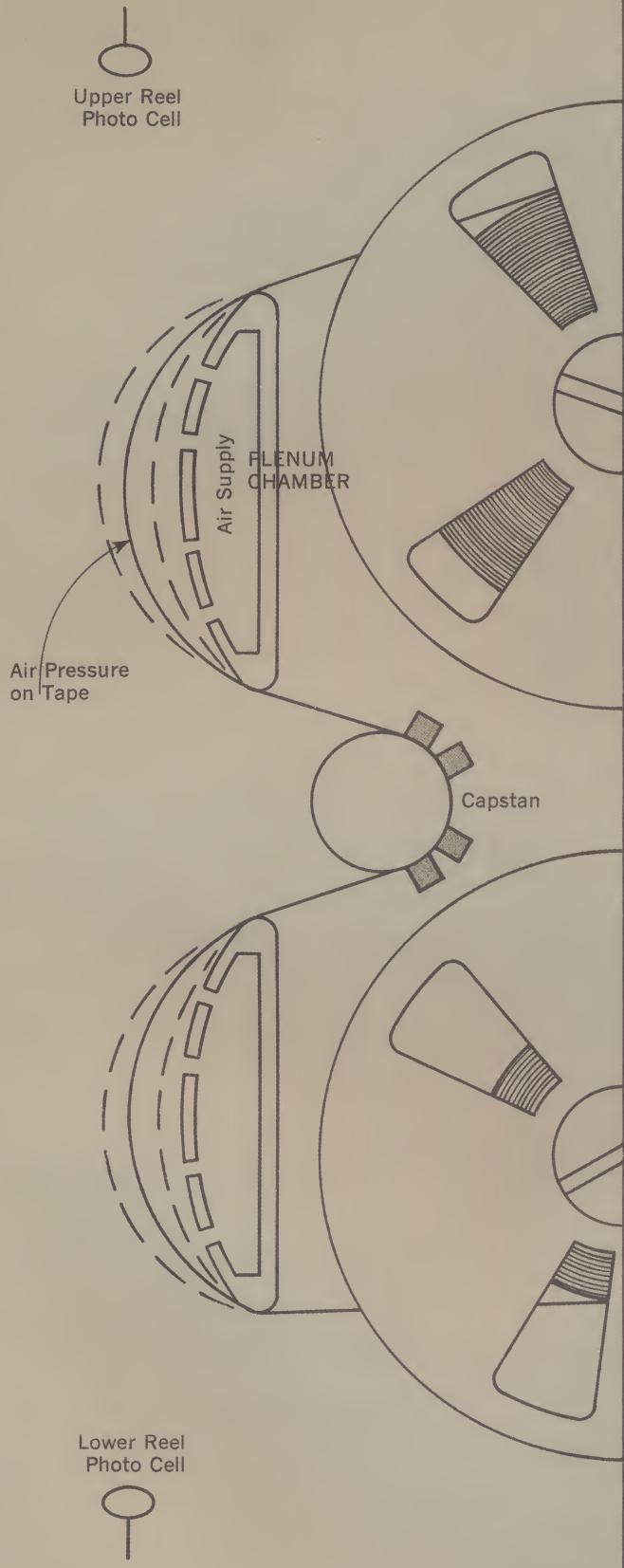
### Simplicity brings new reliability

Because the unique FR-1800 zero loop capstan and chute guides eliminate so many moving parts, they offer increased design simplicity to augment the already high order of simplicity of the recorder. The Ampex FR-1800 has 60% fewer parts than any transport with comparable performance. Besides having fewer parts, the FR-1800 has undergone exhaustive testing. FR-1800's have pulled over 50 million feet of tape (about 10,000 miles) without failure or significant wear during more than 2000 hours of testing.

No mechanical adjustments and less than ten "set and forget" electrical adjustments are required on the transport. Tape threading is simple and foolproof as an added benefit of zero loop design for operator simplicity. Built-in optional shuttle capability simplifies searching for data and makes it possible to repeat data between two preset points.



# FR-1800 TAPE TRANSPORT



## Fast response servo reduces Time Base Error

The FR-1800 capstan is completely servo controlled at all times to assure that all recording is done at absolutely constant speed regardless of power or environmental variations. Balanced in design, the FR-1800 capstan servo is unique in that it combines the benefits of a fast response servo for good time base stability, with a capstan flywheel of adequate mass for minimum flutter. The closed loop servo is crystal referenced during the record mode and referenced from a high-frequency control track signal on the tape during the reproduce mode. This enables the servo to react quickly and to correct for errors caused by tape dimensional changes or speed variations between different recorders and reproducers, thereby maintaining the original time base integrity of your data.

## Zero loop capstan reduces flutter

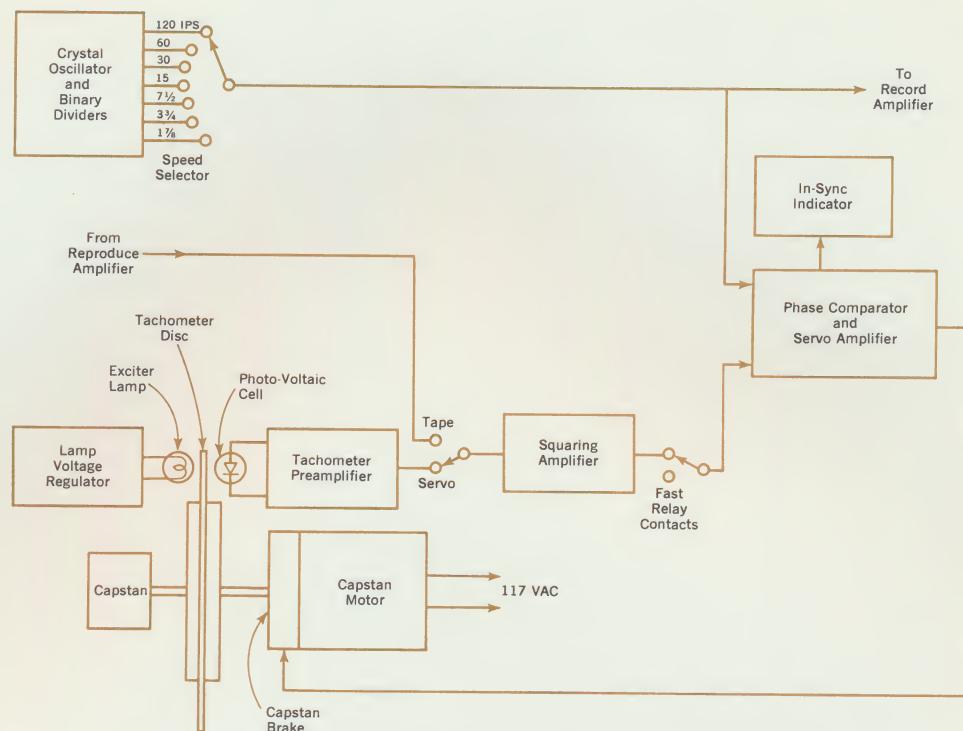
Zero loop tape drive represents a major advance in present day recorder technology. The tape is supported without slip by the capstan at all times throughout the head area. All pinch rollers, idlers, rotating guides, and other moving elements are eliminated. The capstan is the only rotating element in the drive system. Minimum friction is obtained by the use of only two edge guides (integral parts of the chute guides), and no rotating guides.

Results are lower flutter and skew, and improved time base stability, unmatched by any recorder in this price range. An added benefit is the simplified tape threading, which couples simplicity of operation with the inherent design simplicity of the FR-1800.

## Chute guides for decoupling and low skew

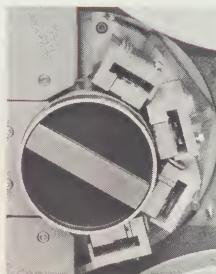
Chute guides with pneumatic cushioning provide total decoupling between reels and capstan to minimize tape perturbations and tension changes. These perturbations, caused by dimensional and tape pack irregularities are a prime source of skew and time displacement error in other recorders. The chutes act as long stationary guides which are nearly frictionless because of the pneumatic cushion on which the tape rides. In addition, each chute acts as a massless storage buffer between reel and capstan to

**FR-1800 Chute Guide plenum chambers and reel servo system.** At left are skew minimizing chute guides with their pneumatic decoupling action. In the center is the large zero loop capstan configuration which significantly reduces flutter. Capstan is controlled in all modes by a fast response servo which provides high time base accuracy. Reel motors are controlled by separate optical/electronic servo systems. Note simple tape threading path.



FR-1800 CAPSTAN SERVO SYSTEM

**FR-1800 zero loop capstan.** Capstan is the only rotating element in the tape path. Tape is locked to the capstan. All pinch rollers, idlers, and rotating guides are eliminated. Heads are IRIG compatible, and plug-in interchangeable. The reproduce heads have adjustable azimuth.



Fail-safe servo minimizes time base errors, provides seven-speed bidirectional operation, electrically switched. Reference is selectable, crystal standard or control track. Loss of control track signal automatically switches servo to internal reference.

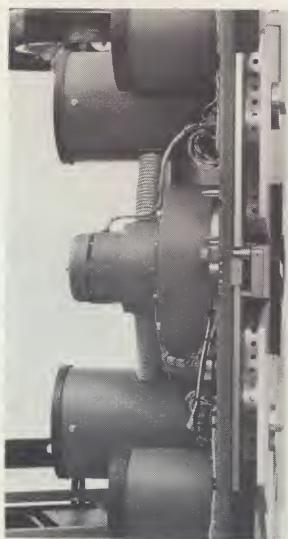
eliminate tape disturbances and perturbations that would otherwise cause skew and flutter. A reel servo system assures that the tape supply remains constant in the chutes throughout the reel of tape regardless of direction or mode of operation.

Another benefit of the pneumatic system in the chute guides is the tape cleaning effect of positive air pressure which blows dust and other impurities off the tape before it enters the head area.

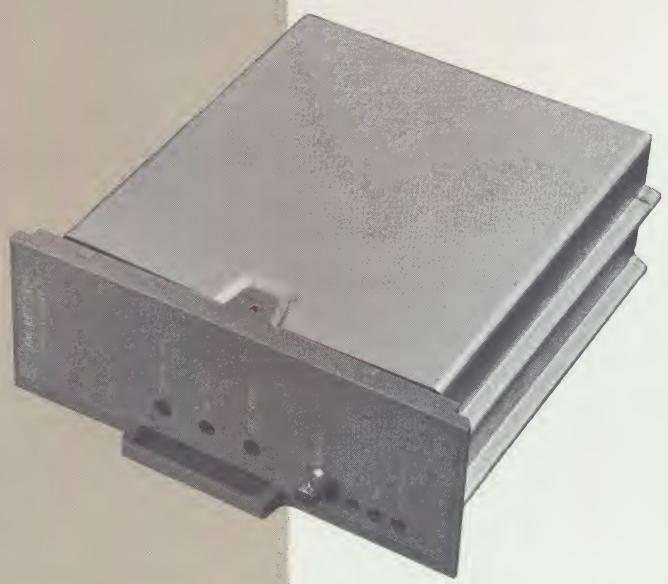
#### Constant head pressure improves head to tape contact

For the first time, head to tape contact is independent of tape tension — an important benefit of the FR-1800 zero loop design. A constant head pressure, responsive to tape thickness variations, improves head to tape contact. Heads retract in fast modes; retraction can be defeated for searching.

**FR-1800 chute guides.** Positive air pressure within the chutes cushions tape and provides decoupling between reels and capstan to eliminate effects at motion or tension perturbations.



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